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REVIEWS.

The Unpublished Papers of the Geological Survey of Brazil. (Folhos restantes ineditos da Comissão Geologica do Brazil.)
Boletim do Museu Paraense, Vol. II, No. 2. Oct. 1897,
pp. 155-204.

At the suggestion of Professor O. A. Derby, now chief of the State Geological Survey of São Paulo, the Pará Natural History Museum (*Museu Paraense*) has undertaken to publish the unpublished papers of the defunct Geological Survey of Brazil relating to the geology and physical geography of the lower Amazon. The October number of the *Boletim* contains the first installment of these papers. The parts thus published consist of an "Introduction," "The Breves Region," and "The Rio Tocantins" by Ch. Fred. Hartt, and of "The Island of Marajo" and a "Reconnaissance of the Rio Mãecurú" by O. A. Derby. These are to be followed later by other chapters on "Rio Trombetas" by Derby, on "Paracary" by Herbert H. Smith, and on the "Tajury," "Paranaquara," "Serra da Maxira," and "Monte Alegre and Ereré" by Hartt.

These papers represent work done by the extinct Comissão Geologia do Brazil from 1875 to 1878, and it might be supposed that it is now too late to publish them, especially as the Museu Paraense has lately begun active work in the same region. But it should be remembered that the State of Pará, occupying the whole of the Lower Amazon, covers an area of 443,900 square miles—nearly twice that of the state of Texas—and that the difficulties of exploration in the dense and trackless forests that cover that sparsely inhabited region are almost or quite beyond the comprehension of those who have not encountered them.

As Hartt well says, when he entered the Amazon valley for the first time in 1870, it was, geologically, a *terra incognita*. Since that time and as the result of the tireless efforts of Hartt and Derby a vast amount of important information has been gathered and published

upon the geology of the Amazon valley. Among these contributions are Hartt's and Rathbun's papers on the Devonian fossils of Pará, Derby's papers on the Carboniferous and on the Physical Geography of the Lower Amazon, and Clarke's report on the Eréré trilobites, besides a number of papers of minor importance, but all of them of value.

Director Goeldi deserves great credit for bringing out at last the work of the men who have done so much and such important pioneer work for geology in Brazil.

The Devonian fauna of the Rio Mãecurú. By DR. F. KATZER.

The same number of the *Boletim* contains an interesting paper by Dr. Friederich Katzer on "The Devonian fauna of the Rio Mãecurú, and its relations to the faunas of the other Devonian terranes of the globe." His studies are based upon the materials gathered by Hartt and Derby and some later collections made in 1896. The conclusion is reached that the Rio Mãecurú fauna resembles more closely that of the middle Devonian of North America than it does the lower Devonian with which it has hitherto been correlated. One of the beds he correlates more exactly with the Hamilton of the New York section. In comparing the fauna with the Devonian of Europe he says it should be compared to the upper part of the lower Devonian. "But as there can be no doubt that the Rio Mãecurú fauna corresponds to that of the Hamilton of North America, which is now considered to belong to the middle Devonian we are obliged to assume *a non-simultaneous development of certain forms in the American and European provinces of the Devonian sea, or a migration of these forms from the latter to the former provinces.* Thus the spirifers with long wings show their principal development in the Rhenish Lower Devonian, but in North America and on the Rio Mãecurú only in the middle Devonian. *Fro-pidoleptus carinatus* Conrad is found on the Rhine in the lower Coblenz beds, while in America, including the Rio Mãecurú territory, it occurs only in the middle Devonian. The same is true of corals of the genus *Pleurodictyum* which, in Europe, are found predominating in the lower Devonian and in America in the middle Devonian.

"All this shows that these groups of animals, probably on account of progressive alterations, especially of depth, in the sea of the first